

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 16308/WO/03	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/IL 03/00582	International filing date (day/month/year) 14.07.2003	Priority date (day/month/year) 15.07.2002
International Patent Classification (IPC) or both national classification and IPC G01N21/47		
Applicant ARIEL LTD. et al.		



1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 30.01.2004	Date of completion of this report 04.11.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office - Glitschiner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840	Authorized Officer Navas Montero, E Telephone No. +49 30 25901-632 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/IL 03/00582**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*):

Description, Pages

1-22 as originally filed

Claims, Numbers

1-19 as originally filed

Drawings, Sheets

1/6-6/6 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
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International application No. **PCT/IL 03/00582**

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	3,7,10
	No: Claims	1,2,4-6,8,9,11-19
Inventive step (IS)	Yes: Claims	
	No: Claims	1-19
Industrial applicability (IA)	Yes: Claims	1-14, 16-19
	No: Claims	15

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IL 03/00582

Re Item I

Basis of the report

- 1 The International Preliminary Examination Authority considers that, contrary to the provisions of **Article 34(2) (b) PCT**, the amendments filed with the letter dated 05.07.2004 go beyond the disclosure of the international application as filed for the following reasons:
 - 1.1 The term "non-interferometric" in the **amended claim 1** is considered as a disclaimer. The use of disclaimers is allowable only in cases where the definition of the matter for which protection is sought cannot be expressed in terms of technical features (**Rule 6.3(a) PCT**). However, no difficulty in that sense justifying the use of a disclaimer could be found in the application. It is, furthermore, considered that the disclosure of document D1 cannot be regarded as an accidental anticipation of **claim 1** since it deals with the same technical problem and solves it in practically the same way, as acknowledged in the description of the application (cf. page 14, lines 9 to 11 of application description). It is, nonetheless, considered that the said disclaimer even excludes the invention itself as it consists of a type of interferometric measurement where the two beams propagate along common paths (cf. page 14, lines 16 to 18)¹.
 - 1.2 No basis could be found in the application as originally filed for the step (g) of the **amended claim 1**. The vague condition "if necessary" present in said step renders the scope of the claim unclear contrary to the provisions of **Article 6 PCT**.
 - 1.3 Consequently and in accordance with **Rule 70.2(c) PCT**, this report will be established as if such amendment had not been made.

¹It is for the same reason that the characterising part of the **amended claim 1** is considered not to be supported by the description, not fulfilling the requirements of **Article 6 PCT**.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2 Reference is made to the following documents:

- D1: ARONS E AND DILWORTH D: "Analysis of Fourier synthesis holography for imaging through scattering materials", APPLIED OPTICS, vol. 34, no. 11, 10 April 1995, pages 1841-1847, XP002260522, USA (cited in the application); and
- D2: ZHANG K AND LILGE L: "Frequency-domain near infrared spectroscopy instrumentation: a simplified design using a high frequency lock-in amplifier." CONFERENCE ON LASERS AND ELECTRO OPTICS CLEO'99. OPT. SOC. AM., 23-28 May 1999, pages 251-252, XP002260523, Washington D.C., USA.

3 The present application does not fulfill the requirements of patentability of **Article 33(1) PCT** because **independent claims 1 and 19** do not fulfill the requirements of novelty of **Article 33(2) PCT**.

3.1 With respect to **claim 1** document D1 discloses a method for determining the optical temporal response of a medium to a short optical pulse excitation, said method comprising the following steps:

- a) sending light through said medium, wherein said light comprises spectral frequencies which make up the Fourier transform of said short pulse to be emulated (cf. page 1842, l-h col., lines 10 to 13);
- b) detecting spectral components of said light exiting said medium (cf. page 1842, l-h col., line 14);
- c) determining the relative amplitude and phase change of each of said spectral components with respect to that of said illuminating light source (cf. page 1842, r-h col., eq. 4 and lines 14 to 16);
- d) obtaining from said relative amplitude and phase change the spectral response of said medium (cf. page 1842, l-h col. lines 45 and 46; and r-h col. eq. 4);
- e) computationally performing an inverse Fourier transform on said spectral response (cf. page 1842, r-h col., lines 17 and 18); and
- f) obtaining the temporal response of said medium to said emulated short pulse from said inverse Fourier Transform (cf. page 1842, r-h col., eq. 5;

lines 21 to 25 and 27 to 31).

3.2 With respect to **claim 19**² document D2 discloses a system for determining the optical temporal response of a medium to a short optical pulse excitation, said system comprising the following components (see fig. 1):

- a tunable laser (cf. additionally page 251, r-h col., lines 32 and 33);
- an RF oscillator (RF lock-in and Amp.);
- modulating means (Bias-T);
- detecting means (APD detector);
- an optically scattering medium (Sample);
- electronic processing means (Amp. after detector and RF lock-in); and
- optional optical elements means (Fiber).

4 **Dependent claims 2, 4, 5, 8, 9, and 11 to 18** are not novel within the meaning of **Article 33(2) PCT**. **Dependent claims 3, 7, and 10** are not inventive within the meaning of **Article 33(3) PCT**.

4.1 Document D1 discloses the additional subject-matter of **claim 2** (cf. page 1842, l-h col., lines 10 to 14), **claims 4 and 5** (cf. fig. 6), **claims 8, 9, 11 to 14, and 16 to 18** (cf. fig. 5), and **claim 15**³ (cf. page 1841, l-h col., lines 8 to 10).

4.2 The additional subject-matter of **claim 3** is disclosed in document D2 (cf. page 251, lines 21 to 24; lines 35 to 42; and page 252, lines 1 to 5).

4.3 The additional subject-matter of **claims 7 and 10** is considered to represent well-known equivalent variations of the configuration disclosed in D1, not bringing any unexpected or surprising technical effect, and therefore non-inventive.

²It could not be identified any technical feature of **claim 19** rendering the apparatus of D2 unsuitable for the determination of the optical temporal response of a medium to a short optical pulse excitation.

³It is pointed out that the additional subject-matter of this claim clearly discloses a diagnostic method which, in accordance with under **Article 34(4)(a)(i) and Rule 67.1(iv) PCT** need not be the subject of the International Preliminary Examination Report.